

# Asymptotic expansion of smooth interval maps

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We show that several different ways to quantify the asymptotic expansion of a non-degenerate smooth interval map coincide. A consequence is an extension to multimodal maps of the remarkable result of Nowicki and Sands giving several characterizations of the Collet-Eckmann condition for unimodal maps. Combined with a result of Nowicki and Przytycki, this implies that several natural non-uniform hyperbolicity conditions are invariant under topological conjugacy. Another consequence is for the thermodynamic formalism of non-degenerate smooth interval maps: A high-temperature phase transition occurs precisely when the Topological Collet-Eckmann condition fails.

Comments: Added corollary on regularity and statistical properties of arbitrary exponentially mixing acip's. A throughout discussion on the optimality of the hypothesis of the Main Theorem'

Subjects: **Dynamical Systems (math.DS)**

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